4.A.—A complete listing of the claims with new numbering as they would appear after allowance

Claims:

What is claimed is:

1. A process of removing sulfur compounds and particulates from a gas comprising the steps of (a) spraying separately controlled functional amounts of a chemical reagent and water into the flue gas inside an enclosure wherein said enclosure has an inlet and an outlet for the gas; and (b) collecting the products of the chemical reaction and particulates inside said enclosure with water condensate on a solid surface, also inside said enclosure, whose temperature is kept from exceeding the dew point temperature of the gas by heat transfer to an external cooling means.

2. The process according to claim 1 wherein chemical reagent and water are sprayed into the gas by an injector.
3. The process according to claim 1 wherein said external cooling means is a plurality of air-cooled cooling fins.
4. The process according to claim 1 wherein said solid surface is cleaned of collected condensate and particulates by a plurality of scrapers.
5. The process according to claim 1 wherein the amount of chemical reagent is controlled by a chemical reagent supply flow controller.
6. The process according to claim 1 wherein the amount of water is controlled to prevent supersaturating the gas by a water supply flow controller.
7. The process according to claim 1 wherein said external cooling means is a water jacket.
8. The process according to claim 1 wherein said external cooling means is a refrigerant.
9. The process according to claim 1 wherein said solid surface is cleaned of collected condensate and particulates by a water spray.

4.B.---A complete listing of all of the claims as originally submitted (including withdrawn claims)

1. A process for removing sulfur compounds and particulates from a flue gas comprising the steps of:

a) injecting a controlled mixture of a chemical reagent and water into the flue gas, and

b) compelling said flue gas to interact with a solid surface.

2. The process of Claim 1 wherein said solid surface is inside an enclosure.
3. The process of Claims 1 and 2 wherein said enclosure has an inlet means for admitting said flue gas into said enclosure.
4. The process of Claims 1 and 2 wherein said enclosure has an outlet means for allowing said flue gas to exit said enclosure.
5. The process of Claim 1 wherein said solid surface is cooled by a cooling means to keep the temperature of said solid surface from exceeding the dew point temperature of said flue gas.
6. The process of Claim 1 wherein said solid surface is cleaned of condensate and collected particulates by a cleaning means.
7. The process of Claim 1 wherein said controlled mixture comprises: an amount of water which will not cause said flue gas to be supersaturated, and an amount of chemical reagent which is a function of the amount of sulfur compounds in said flue gas.
8. The process of Claim 1 wherein said controlled mixture is sprayed into said flue gas by an injector means.
9. The process of Claims 1 and 8 wherein said controlled mixture is delivered to said injector means by an injection pump means.
10. A process of concurrently removing sulfur compounds and particulates from a gas such that the gas is relatively dry after undergoing said process comprising the steps of

(a) spraying a mixture of chemical reagent and water into the gas inside an enclosure while separately controlling the components of said mixture; and

(b) collecting the products of the chemical reaction and particulates inside said enclosure with the condensate on a solid surface, also inside said enclosure, whose temperature does not exceed the dew point temperature of the gas.

11. The process according to claim 1 wherein said mixture is sprayed into the gas by an injector means.

12. The process according to claim 1 wherein said enclosure has an inlet means to allow entry of the gas.

13. The process according to claim 1 wherein said enclosure has an outlet means to allow exit of the gas.

14. The process according to claim 1 wherein said solid surface is cooled by a cooling means.

15. The process according to claim 1 wherein said solid surface is cleaned of collected condensate, products of the chemical reaction and particulates by a cleaning means.

16. The process according to claim 1 wherein the amount of chemical reagent in said mixture is controlled by a chemical reagent supply flow control means.

17. The process according to claim 1 wherein the amount of water in said mixture is controlled to prevent supersaturating the gas by a water supply flow control means.

18. The process according to claim 1 wherein said external cooling means is a water jacket.

19. The process according to claim 1 wherein said external cooling means is a refrigerant.

20. The process according to claim 1 wherein said solid surface is cleaned of collected condensate and particulates by a water spray.

4.C.--- A complete listing of all of the claims with the proper status identifiers (brackets for deletions and underscoring for additions)

1. (canceled) A process for removing sulfur compounds and particulates from a flue gas comprising the steps of:

a) injecting a controlled mixture of a chemical reagent and water into the flue gas,and

b) compelling said flue gas to interact with a solid surface.

2. (canceled) The process of Claim 1 wherein said solid surface is inside an enclosure.
3. (canceled) The process of Claims 1 and 2 wherein said enclosure has an inlet means for admitting said flue gas into said enclosure.
4. (canceled) The process of Claims 1and 2 wherein said enclosure has an outlet means for allowing said flue gas to exit said enclosure.
5. (canceled) The process of Claim 1 wherein said solid surface is cooled by a cooling means to keep the temperature of said solid surface from exceeding the dew point temperature of said flue gas.
6. (canceled) The process of Claim 1 wherein said solid surface is cleaned of condensate and collected particulates by a cleaning means.
7. (canceled) The process of Claim 1 wherein said controlled mixture comprises: an amount of water which will not cause said flue gas to be supersaturated, and an amount of chemical reagent which is a function of the amount of sulfur compounds in said flue gas.
8. (canceled) The process of Claim 1 wherein said controlled mixture is sprayed into said flue gas by an injector means.
9. (canceled) The process of Claims 1 and 8 wherein said controlled mixture is delivered to said injector means by an injection pump means.
10. (currently amended) A process of [concurrently] removing sulfur compounds and particulates from a gas [such that the gas is relatively dry after undergoing said process] comprising the steps of

(a) spraying [a mixture] <u>separately controlled functional amounts</u> of a chemical reagent and water into the flue gas inside an enclosure [while separately controlling the components of said mixture]

wherein said enclosure has an inlet and an outlet for the gas; and

(b) collecting the products of the chemical reaction and particulates inside said enclosure with [the] water condensate on a solid surface, also inside said enclosure, whose temperature [does not exceed] is kept from exceeding the dew point temperature of the gas by heat transfer to an external cooling means.

11.(currently amended) The process according to claim 1 wherein [said mixture is] chemical reagent and water are sprayed into the gas by an injector [means].

12.(canceled) The process according to claim 1 wherein said enclosure has an inlet means to allow entry of the gas.

13.(canceled) The process according to claim 1 wherein said enclosure has an outlet means to allow exit of the gas.

14.(currently amended) The process according to claim 1 wherein said [solid surface is cooled by a cooling means] external cooling means is a plurality of air-cooled cooling fins.

15.(currently amended) The process according to claim 1 wherein said solid surface is cleaned of collected condensate [, products of the chemical reaction] and particulates by a [cleaning means] plurality of scrapers.

16.(currently amended) The process according to claim 1 wherein the amount of chemical reagent [in said mixture] is controlled by a chemical reagent supply flow [control means] controller.

17.(currently amended) The process according to claim 1 wherein the amount of water [in said mixture] is controlled to prevent supersaturating the gas by a water supply flow [control means] controller.

18.(new) The process according to claim 1 wherein said external cooling means is a water jacket.

19.(new) The process according to claim 1 wherein said external cooling means is a refrigerant.

20.(new) The process according to claim 1 wherein said solid surface is cleaned of collected condensate and particulates by a water spray.